



# Forest Insect & Disease Management

FILE  
Evaluation Report

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## COMPARISON OF DEVELOPMENT OF ECTOMYCORRHIZAE ON 1-4

RED PINE SEEDLINGS FROM TOUMEY MINNESOTA

NATIONAL FOREST NURSERY AND ADJACENT LAND

by

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### INTRODUCTION

In 1975, State & Private Forestry, Forest Insect & Disease Management began a red pine mycorrhizae survey at the Federal Nurseries in the Lake States. The survey was designed to determine if the development of ectomycorrhizae on the red pine was adequate. During the survey it was noted that transplant stocks established for scleroderris monitoring, would provide excellent comparison of development of ectomycorrhizae on trees transplanted in nursery soil and adjacent forest soils.

### OBJECTIVE

The purpose of this evaluation was to determine the differences in the ectomycorrhizae development between 1-4 nursery soil transplants and 1-4 forest soil transplants.

### METHODS

Transplant samples were taken from nursery soil transplant beds and from the forest soil transplant beds for analysis. The roots were examined for the number of feeder roots with ectomycorrhizae, total number of feeder roots, and percentage of the root system with ectomycorrhizae.

## RESULTS AND DISCUSSION

The seedlings from the forest soil transplant beds had 48.9 percent (SE 0.8) of the feeder-roots ectomycorrhizal. The seedlings from the nursery soil transplant beds had 31 percent (SE 0.9) of the feeder-roots ectomycorrhizal. All the seedlings had some ectomycorrhizae development. The difference in percentages between the two groups is statistically significant at the 95% confidence level. Five-year-old seedlings observed in natural stands adjacent to the nursery had ectomycorrhizae on approximately 75 percent of their root systems. Previous field observations of 3-year-old outplanted red pine seedlings revealed that the ectomycorrhizae percentages increased from 25 to 90 percent after 1 year in the field. This suggests that seedling density in the nursery bed and the development of ectomycorrhizae may be related.

## CONCLUSION

1. Ectomycorrhizae develop faster on root systems of seedlings grown in natural soil than on seedlings in the nursery soil.
2. The variety of cultural practices at the nursery seem to affect development of mycorrhizae.
3. A comprehensive investigation is needed to determine the effects of cultural practices on the development of ectomycorrhizae on red pine feeder roots.

